

CHAPTER 10

SIMULATING ECONOMIC POLICY WITH THE COMET MODEL

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1. INTRODUCTION

Over the years an increasing number of forecasts and alternative simulation experiments have been made with versions of COMET. These involved discussions with various members of the Staff at the Commission of the European Communities which have enriched later versions of the model. In particular Messrs. Castermans, Ranuzzi, Robinson, Schubert, Rohaert, Charpin, Toft Nilson, and recently Dramais and Sfiroeras have in this way contributed to the development of the project. This has given COMET the possibility to acquire maturity and credibility resulting in its recognition as a useful tool in the design of economic policy.

In this spirit we present here some new results obtained with COMET IV. A number of alternative simulations are made in two different ways: for one individual country separately and for the countries of the European Community (Belgium, Denmark, Germany, Greece, France, Ireland, Italy, The Netherlands and the United Kingdom) all jointly. It is interesting indeed to check whether policies followed by individual countries are either offset or reinforced when all European countries follow the same policy.

The first three sets of simulations, each time a simulation A for an individual country and a simulation B for all EEC countries, are related to policies aiming at an improvement of international competitiveness. The fourth set of simulations is related to public investment policies. Simulations of type B will be referred to as coordinated actions.

2. NOMINAL WAGE RATE DECREASE IN GERMANY AND IN THE EUROPEAN COMMUNITY

The effects of a nominal wage rate decrease are obtained as the difference between two simulations: the alternative simulation which includes a sustained wage rate

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decrease and a free reference simulation. The alternative simulation is obtained by keeping the wage rate exogenously at a level which is below the level of the reference simulation by an amount which reduces the wage bill by 1% of the 1983 GDP at current prices. This is done for Germany separately and for all European countries jointly. This corresponds to an exogenous decrease of the German wage rate by -1.71% in 1983 and by decreasing percentages up to -1.02% in 1988. For the European Community the exogenous wage shifts are -1.8% in 1983 up to -1.0% in 1988.

The effects are presented in Table 1 for the percentage differences in the following variables:

- WR – wage rate
- PC – consumers price index
- YO – gross domestic product
- IPO – gross investments in fixed assets
- N – employment
- UR – unemployment rate (over active population)
- TBR – current trade balance ratio (over total exports)
- SGR – current government balance ratio (over total government receipts)

The results are deflationary in the short run: in 1983 in Germany the GDP decreases by 0.16 in the German wage rate simulation and by 0.23 in the European wage rate simulations. In the long run, after 6 years, the German GDP increases by 0.44 and by 0.35 respectively. In terms of employment, the long term elasticities resulting from the simulation are 0.45 and 0.37 respectively. The individual German wage policy is offset by the joint European wage policy by only 0.08. In other words, the fact that all European neighbours follow the same wage policy as Germany reduces its long term efficiency in terms of employment by only 8% out of 45%. It is also interesting to notice that the increased employment is obtained with only a temporary loss in real wage rate (-1.49 and -1.45 respectively) and a small gain in real wage rate after 6 years ($+0.06$ and 0.11 respectively). This is due to the long term gain in the volume of value added.

The deflationary effects disappear after only 1 year. GDP results to be 0.05 higher than the reference after 1 year as can be seen from the bottom lines of Table 1.

One would ask whether this result is not typical for a large EEC country and whether a small country would not be able to benefit more from a solitary wage policy and lose these benefits when all other European partners compete with similar wage cuts. This does not seem to be the case as can be seen from the next set of simulation results where the gross wage rates are decreased via a reduction of the employers' social security contribution rates.

Table 1. Wage rate decrease (− 1% of GDP)

	WR	PC	YO	IPO	N	WR	TBR	SGR
<i>A in Germany</i>								
effects on Germany								
1983	− 1.71	− 0.22	− 0.16	− 0.55	− 0.15	0.14	0.22	− 0.28
1988	− 1.02	− 0.96	− 0.44	0.38	0.45	− 0.28	− 0.22	0.53
effects on the EEC								
1983	− 0.5	− 0.1	− 0.1	− 0.2	0.0	0.0	0.1	− 0.1
1988	− 0.4	− 0.4	0.2	0.2	0.1	− 0.1	0.1	0.3
<i>B in the EEC</i>								
effects on Germany								
1983	− 1.71	− 0.26	− 0.23	− 0.60	− 0.18	0.17	0.29	− 0.34
1988	− 1.02	− 1.13	0.35	0.36	0.37	− 0.23	− 0.16	0.46
effects on the EEC								
1983	− 1.8	− 0.4	− 0.2	− 0.4	− 0.1	0.1	0.2	0.0
1988	− 1.0	− 1.1	0.3	0.2	0.3	− 0.2	0.1	0.8
change in Germany; effects on German GDP (YO)								
1983		1984	1985		1986		1987	1988
	− 0.16	0.05	0.19		0.33		0.42	0.44
change in the EEC; effects on German GDP (YO)								
	− 0.23	0.03	0.13		0.29		0.38	0.35

3. EMPLOYERS' SOCIAL SECURITY CONTRIBUTION RATE DECREASE IN BELGIUM AND IN THE EUROPEAN COMMUNITY

In COMET IV the employers social security contribution rate is an exogenous component of the gross wage costs per employee. This exogenous contribution rate is used as a policy instrument to decrease the wage rate cost by the amount which decreases the wage bill by 1% of the 1983 GDP at current prices. This is done first for Belgium separately where one reduces the contribution from 16.7% to 14.5% and then for the European Community where the rates are decreased by 2.2% in Germany, 3.1% in France, 2.7% in Italy, 2.8% in the Netherlands, 2.2% in Belgium, 2.2% in the United Kingdom, 1.9% in Ireland, 1.9% in Denmark and 3.4% in Greece.

These interventions result in instantaneous changes of the wage rate by − 2.09% in the Belgian case and − 2.23% in the European case. The effects are presented in Table 2.

In the very short run, the current period, the effects are positive for GDP only and for employment slight but negative on the current trade balance and the current government balance. One year later all objectives benefit from the measure. In the Belgian experiment, employment increases by 1.23% after 3 years and by

Table 2. Employers social security contribution rate (in wage cost)

	WR	PC	YO	IPO	N	UR	TBR	SGR
<i>A in Belgium</i>								
Effects on Belgium								
1983	-2.09	-0.30	0.44	-0.21	0.12	-0.12	-0.38	-0.86
1985	-2.02	-0.62	1.00	0.37	1.23	-1.12	0.09	0.51
1988	-0.17	0.42	0.24	-0.58	0.63	-0.74	0.27	0.87
Effects on the EEC								
1983	-0.10	-0.02	0.04	0.02	0.02	-0.02	0.02	-0.01
1985	-0.10	-0.06	0.05	0.03	0.06	-0.05	0.03	0.04
1988	-0.02	-0.01	0.01	0.01	0.02	-0.02	0.00	0.04
<i>B in the EEC</i>								
Effects on Belgium								
1983	-2.15	-0.43	0.80	-0.12	0.28	-0.27	-0.02	-0.32
1985	-2.21	-0.94	1.11	0.50	1.39	-1.25	0.28	0.74
1988	-0.65	-0.19	0.45	-0.30	0.68	-0.79	0.49	1.03
Effects on the EEC								
1983	-2.23	-0.57	0.48	0.25	0.22	-0.20	-0.15	-1.24
1985	-2.06	-1.47	0.86	0.77	1.11	-0.77	-0.07	-0.70
1988	-1.60	-1.69	1.12	0.50	1.19	-0.76	-0.06	-0.18
Effects on the government balances (SGR) in % of GDP								
	1983		1985		1988			
DB	-1.53		-0.72		-0.23			
FR	-1.02		-0.18		0.82			
IT	-1.36		-0.59		0.09			
NL	-0.37		0.12		0.51			
BE	-0.32		0.74		1.03			
UK	-0.79		-1.21		-1.46			
IR	-1.05		-1.14		-1.44			
DK	-1.26		-1.17		-0.86			
HE	-1.32		-1.29		-1.01			

0.63% after 6 years with favourable effects on the current trade balance and government balance. In the joint European action case one can see that the Belgian economy does not lose its benefits, on the contrary. Employment increases more, and this results from a global improvement of activity in Europe; the trade balance does not deteriorate significantly by the first year and improves by 0.49 points while the government balance gains more than one full point after 6 years. After only 2 years the initial decrease of social security returns of the government (-0.32) are more than compensated by an improvement (0.74) of the government balance. This leaves net gains after more or less 1.5 year. Instead of offsetting each other these policies reinforce each other at the European level as can be seen from the performances of European employment. In Belgium, the initial increase of the

government deficit, which directly goes to the enterprises, is a small cost to be paid for a large medium term benefit for the government finances, for the trade balance, for employment and for growth. For some other countries the improvement of government finances, is much more slow to obtain. Their government balances react as shown in the bottom lines of Table 2. According to their structures the countries with large external trade proportions in GDP and larger supply determined competitiveness effects of domestic costs on exports are able to achieve a much larger self financing of social wage cost reductions.

As compared to the previous policy which showed weak neutralizing effects of direct decreases of the wage rates from other countries, in the case of social wage cost reductions, the European policies reinforce each other.

4. EXCHANGE RATE CHANGES

And the exchange rate changes? How do they modify the competitive positions and what are the resulting short term and long term effects on employment (N), growth (YO), the current trade balance (TBR), the current government balance (SGR) and prices (PC)?

In the first simulation, the French franc is devalued by 10% with respect to all other currencies. In the second simulation all European currencies are devalued by 10% with respect to all other world currencies. The results are presented in Table 3. Let us note that the ECU has been devaluing by more than 40% wrt. the US \$ since 2 years.

The effects are very different in the short run and in the long run. In the short run there exists a competitive or profitability advance for France which in all cases increases output investment and employment, but to a much larger extent (the effect is more than double) when the European Community devalues. In the short run there is a perverse effect on the current trade balance in France (J curve) while this is not the case for Europe as a whole. In the long run, however, the trade balance on the one hand improves relatively more in France in the case when France devalues alone. Inflationary pressures on the other hand offset the devaluations. The final result after 6 years shows lower activity, lower investment, lower employment in all cases. One can say that the high \$ and the high Yen have provided a temporary relief for the European economy, with up to 0.8% more employment after two years. Simultaneously, however, more expensive raw materials cause inflationary pressures which are progressively transmitted into the domestic price systems. Benefits from the devaluations could even turn into dramatic inflationary episodes, depending on the price wage spirals and related effects.

Table 3. Exchange rate change (+ 10%)

	WR	PC	YO	IPO	N	UR	TBR	SGR
<i>A in France</i>								
Effects on France								
1983	1.0	1.3	0.5	0.3	0.1	-0.1	-1.4	0.2
1984	2.3	2.9	1.1	0.6	1.1	-0.9	1.4	2.6
1988	8.5	8.8	-1.1	-1.9	-0.6	0.4	2.8	1.0
Effects on the EEC (in US \$)								
1983	-1.8	-1.8	0.2	0.1	0.0	-0.0	0.0	0.1
1984	-1.6	-1.6	0.2	0.1	0.2	-0.1	0.1	0.4
1988	-0.6	-0.7	-0.3	-0.5	-0.2	0.1	0.3	0.1
<i>B in the EEC</i>								
Effects on France								
1983	0.6	0.8	1.1	1.4	0.5	-0.4	-0.5	1.0
1984	1.5	2.0	0.7	-0.2	1.0	-0.6	1.7	1.7
1988	6.4	6.7	-1.1	-1.8	-1.0	0.7	1.4	0.0
Effects on the EEC (in ECU)								
1983	0.9	0.8	1.1	1.1	0.5	-0.4	-0.0	1.0
1984	1.9	2.0	0.6	-0.2	0.8	-0.6	1.0	1.6
1988	5.3	5.9	-0.8	-1.5	-0.3	0.2	1.1	-0.5

5. PUBLIC INVESTMENT MULTIPLIER

The Keynesian public investment expenditure remedies are still alive as can be seen in the report to the European Parliament by Albert (1983). His basic idea was that a concerted action generates more return than the simple sum of the individual actions. We will illustrate this with COMET IV in the same way he has done it with COMET III. The order of magnitudes of the multipliers and their dynamic patterns are different in both models. COMET IV includes a more refined factor demand system where each component of final demand has specific production factor and import contents. COMET IV also comprises financial and monetary feedbacks as a result of increased investment demand by the government.

Table 4 presents the effects of an exogenous and sustained shift of the exogenous public investments volume by amounting to 1% of 1983 GDP in current prices deflated by the investment price index in the United Kingdom and in the European Community. The effects on the GDP of the United Kingdom, which can be directly interpreted as multipliers are 0.6 and 0.8 in the short run and 0.0 and 0.1 in the long run (after 6 years) in the case of an individual and of a joint European action, respectively. It is worth noting that the multipliers are significantly lower and decrease significantly faster than in what is shown by Albert (1983), *nl.* in the case

Table 4. Public investment (+ 1% of GDP)

	WR	PC	YO	IPO	N	UR	TBR	SGR ¹
<i>A in the U.K.</i>								
Effects on the U.K.								
1983	0.0	-0.0	0.6	0.2	0.3	-0.3	-1.9	0.7
1988	0.3	-0.3	0.0	-0.4	0.5	-0.5	0.0	1.7
Effects on the EEC								
1983	-0.0	-0.0	0.2	0.2	0.1	-0.1	-0.1	0.3
1988	0.2	-0.1	0.0	-0.1	0.1	-0.1	0.1	0.6
<i>B in the EEC</i>								
Effects on the U.K.								
1983	-0.0	-0.0	0.8	0.3	0.5	-0.4	-1.1	1.0
1988	0.6	-0.1	0.1	-0.5	0.6	-0.5	0.6	1.9
Effect on the EEC								
1983	0.0	-0.1	1.2	1.1	0.7	-0.6	-0.9	1.4
1988	1.6	0.8	0.4	-0.9	0.5	-0.4	-0.1	0.8
Effects over time								
	1983	1984	1985	1986	1987	1988		
A. YO UK	0.55	0.23	0.20	0.68	0.55	0.02		
YO EU	0.24	0.12	0.12	0.27	0.18	0.01		
B. YO UK	0.83	0.36	0.30	0.84	0.64	0.09		
YO EU	1.21	0.74	0.62	0.92	0.68	0.44		
COMET III Albert (1983)								
A. YO UK		0.9	1.1					
B. YO EU		1.6	1.5					

¹ Does not include the additional investments themselves.

of the individual action of the United Kingdom 0.9 after 2 years and 1.1 after 3 years and in the case of concerted action of all European countries 1.6 after 2 years and 1.8 after 3 years. It is also interesting to note the cyclical nature of the new multipliers showing a periodicity of 4 years. For the European Community the multiplier goes from 1.21 the current year to 0.62 the third year, increases again to 0.92 the fourth year and decreases to 0.44 the sixth year. Still, the employment effects are not unimportant. It also remains true that in the long run, the trade balance constraint is much easier in the case where the United Kingdom participates in a joint investment action.

6. CONCLUSION

A conclusion should start with a word of caution. The simulation results shown are valid for the 'research version' of the COMET IV model which includes a given set

of mechanisms and coefficient values which are open for discussion. It would be of interest to compare alternative simulations of the model using alternative mechanisms to determine sets of variables. As an example one could mention the acceleration and the profit version of the investment equations, different regimes on the financial markets

The importance of the results, however, is their demonstration of the comparative advantage of COMET as a policy instrument in the possibility to cover the world economic mechanisms without losing the information about the individual countries of the model.

The measurement of the effects of joint actions as compared to the sum of individual actions may lead to the measurement of quantitative arguments for cooperation.

The exact cooperation argument is that the individually rational actions could in certain cases lead to a stable suboptimal solution for all players. This solution can be replaced by a Pareto optimal solution if all players can agree to act jointly in view of a fully informed collective rationality. They can all increase their returns compared to the returns of a Nash equilibrium. In practice no such cooperative solutions were found in the simulations shown in this paper when employment is considered as the objective. Coordinated actions as defined above should not be considered as cooperative actions in the sense of game theory.

What the simulations did show is that joint policy actions do not end up with neutralizing competitive effects.

The policies which have been simulated, when yielding positive results, followed by an individual country, yield comparable results when all countries follow them jointly. This means that coordination cannot be justified on just these types of arguments.

NOTES

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Note of the editors: the version given here consists of Section II of the paper presented at the workshop of the AEA. The first section, which has been omitted, was a brief presentation of the COMET model.

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